ETCH SELECTIVITY ENHANCEMENT FOR TUNABLE ETCH RESISTANT ANTI-REFLECTIVE LAYER

ABSTRACT OF THE DISCLOSURE

Methods for generating a nanostructure and for enhancing etch selectivity, and a nanostructure are disclosed. The invention implements a tunable etch-resistant anti-reflective (TERA) material integration scheme which gives high etch selectivity for both etching pattern transfer through the TERA layer (used as an ARC and/or hardmask) with etch selectivity to the patterned photoresist, and etching to pattern transfer through a dielectric layer of nitride. This is accomplished by oxidizing a TERA layer after etching pattern transfer through the TERA layer to form an oxidized TERA layer having chemical properties similar to oxide. The methods provide all of the advantages of the TERA material and allows for high etch selectivity (approximately 5-10:1) for etching to pattern transfer through nitride. In addition, the methodology reduces LER and allows for trimming despite reduced photoresist thickness.